

REMARKS

The purpose of this preliminary amendment is to clarify the application as originally filed. Favorable consideration of this application is respectfully requested.

Respectfully submitted,

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ATTACHMENT FOR SPECIFICATION AMENDMENTS

The following is a marked up version of each replacement paragraph and/or section of the specification in which underlines indicate insertions and brackets indicate deletions.

SUMMARY OF THE INVENTION

[0003a] In accordance with an aspect of the invention, a circuit board assembly has [a] a circuit board and an integrated circuit package. The integrated circuit package has a substrate having an array of solder columns extending from a bottom surface. The integrated circuit package has a lid that is affixed to top of the substrate. The lid is oversized with respect to the substrate so that it has a portion that extends beyond the outer periphery of the substrate. In an aspect of the invention, the periphery of the lid is larger than the outer periphery of the substrate so that the portion of the lid extending beyond the outer periphery of the substrate extends around the outer periphery of the substrate. Supports shims are disposed between the portion of the lid extending beyond the outer periphery of the substrate and portions of a circuit board when the CGA integrated circuit package is mounted on the circuit board. The support shims support the column grid array integrated circuit package against compressive force, such as would be exerted by a cooling solution mounted on the CGA integrated circuit package, and are made of sufficiently rigid material to do so, such as metal or plastic.

ABSTRACT OF THE DISCLOSURE

A circuit board assembly has a circuit board and a column grid array ("CGA") integrated circuit package. The CGA integrated circuit package has a substrate having an array of solder columns extending from a bottom surface. An oversized lid is affixed to the substrate. Support shims are disposed between a portion of the lid that extends beyond an outer periphery of the substrate and a circuit board to which the CGA integrated circuit package is mounted. The support shims are affixed to the lid with adhesive after the CGA integrated circuit package [in] is mounted on the circuit board. The adhesive accommodates any variations in height in the CGA integrated circuit package.

ATTACHMENT FOR CLAIM AMENDMENTS

The following is a marked up version of each amended claim in which underlines indicate insertions and brackets indicate deletions.

1. (Amended) A circuit board assembly, comprising:
 - a. a circuit board;
 - b. an integrated circuit package having a substrate with an array of solder columns extending from a bottom surface of the substrate to the circuit board when the integrated circuit package is mounted on the circuit board;
 - c. a lid affixed to the substrate, the lid having a portion that extends beyond an outer periphery of the substrate; and

[c.] d. at least one support shim disposed between the portion of the lid that extends beyond the outer periphery of the substrate and a portion of the circuit board to which the [column grid array] integrated circuit package is mounted to support the column grid array integrated circuit package against compressive force.

4. (Amended) The apparatus of claim 2 wherein the [column grid array] integrated circuit package is rectangular and the said at least one support shim includes a support shim disposed at each corner of the [column grid array] integrated circuit package.

7. (Amended) The apparatus of claim 6 wherein adhesive is disposed between the top flange of each support shim and the portion of the lid extending beyond the outer periphery of the substrate to affix the support shim to the

[column grid array] integrated circuit package and to fill gaps between the top flanges of the support shims and the portion of the lid extending beyond the outer periphery of the substrate.

8. (Amended) A circuit board assembly, comprising:

- a. a circuit board;
- b. a rectangular column grid array integrated circuit package

having a substrate with an array of solder columns extending from a bottom surface;

[b.] c. a lid affixed to the substrate, the lid having a portion that extends beyond an outer periphery of the substrate; and

[c.] d. a support shim disposed at each corner of the column grid array integrated circuit package between the portion of the lid that extends beyond the outer periphery of the substrate and a portion of a circuit board to which the column grid array integrated circuit package is mounted to support the column grid array integrated circuit package against compressive force, each support shim disposed between the lid and the circuit board after the column grid array integrated circuit package has been mounted to the circuit board and secured to at least one of the substrate and lid by adhesive, the adhesive accommodating variations in height in the column grid array integrated circuit package.

13. (Amended) The method of claim 12 and further including the step of affixing the at least one support [member] shim by adhesive to the lid, the adhesive accommodating any variations in height of the integrated circuit package.

14. (Amended) The method of claim 13 wherein the step of affixing the at least one support [member] shim by adhesive to the lid includes filling any gaps between the lid and the at least one support [member] shim with the adhesive.

15. (Amended) The method of claim 13 wherein the integrated circuit package is rectangular and the step of providing the at least one support [member] shim includes providing at least one support [member] shim at each corner of the integrated circuit package.

16. (Amended) The method of claim 13 wherein the integrated circuit package is rectangular and the step of providing the at least one support [member] shim includes providing at least one support [member] shim at each side of the integrated circuit package.